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COMPUTER CATALOGUING
AND
INDEXING SURVEY

Summary

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by

JEM Research

Victoria, B.C.

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Alberta
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Devonian Building, West Tower, 11160 Jasper Avenue, Edmonton, Alberta, Canada T5K 0L2

March, 1983

TO THE READER:

This summary reports on the results of the Survey of Computer Cataloguing and Indexing Systems, conducted by JEM Research for the governments of New Brunswick, Nova Scotia, Ontario, Northwest Territories, Alberta and British Columbia.

Many recommendations have been submitted, dealing primarily with issues such as standardized descriptions and evaluations, a coordinating agency to be established to administer these activities, and planning for the time when courseware will be obtained and distributed electronically.

Copies of the full report are available upon request from Planning Services, Alberta Education, 11160 - Jasper Avenue, Edmonton, Alberta, T5K 0L2.

Sincerely,

H.I. Hastings

H. I. Hastings
Director
Planning Services

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INTRODUCTION

The 200-page report by JEM Research of Victoria, B.C., represents the culmination of four months of intensive research of both the field and literature about the state of information dissemination regarding educational software.

Included in the project is an analysis of educational software information available to educators, an assessment of needs as expressed by educators throughout Canada, and the generation of an implementation plan designed to make the two more congruent.

JEM Research, in this report, addressed the problems inherent in the collection, organization, and dissemination of information about educational software and suggested a structure for effectively accomplishing these activities. This Staff Summary combines the report's Executive Summary with the researchers' recommendations to the Ministries of Education of Alberta, British Columbia, New Brunswick, Northwest Territories, Nova Scotia, and Ontario.

PROCEDURE

In order to arrive at the recommendations, the nature of available information about educational software was examined with reference to quality, quantity, availability, and appropriateness.

Requirements (as expressed by educators at all levels across Canada) of a variety of users--teachers, students, librarians, resource personnel, and administrators--were considered.

The consensus was that current information capabilities--software catalogues, vendor publicity materials, and educational resource centers--do not satisfactorily meet the user needs.

Users expressed their opinions regarding the "state of the art" of information organization regarding educational software:

1. dissatisfaction with the present quality, quantity, and format of information;
2. frustration with the dearth of coordinated resource and information sharing among schools, boards, regions, and provinces;
3. certainty that educators' workloads and lack of funding preclude their ability to make a concerted effort to organize the information to meet their needs;
4. anger, in light of the lack of funding, at the duplication of work and expense in the few attempts to provide the information, the results of which are often inadequate;
5. concern that lack of easily-accessible information will inhibit and discourage the broader educational use of software, similar to the disenchantment with educational television;

6. desire for an authority to assume the initiative and provide the direction and funding required to remedy the problem and ameliorate the user concerns;

7. desire for real provincial cooperation in this matter (general pessimism exists, due to the political-educational structure).

Educators expressed their frustration that, although the most cost-efficient and least duplicative arrangement for information-sharing seemed to be provincial cooperation under a coordinating body, this kind of national coordination was not likely to happen. They were nevertheless eager to contribute to the survey and analysis, since the discussions provided, in many instances, an opportunity for representatives of very different disciplines to discuss common concerns in instructional computing.

SOFTWARE REQUIREMENTS

The requirements as stated by the representatives included:

1. thorough descriptions of available materials;

2. standard descriptions which could be easily understood by all users;

3. easily-accessible descriptions available in one catalogue or accessed through a database;

4. evaluations;

5. interface and comparability with descriptions of other educational resources.

Field discussions were most often concerned with two notions:

1. the desirable elements or fields of a standard description, and

2. the method of information gathering and dissemination.

Most people interviewed agreed that a centralized system of one sort or another would be the most effective, but questioned the possibility of a coordinated national effort, given the structure and history of educational responsibility in Canada.

Additionally, some individuals questioned the blanket applicability of a centralized system, given regional requirements, geographic inhibitors to full participation in such a system, and fears of unequal treatment of the "poorer" and less vocal provinces.

Literature on educational software organization is minimal, but literature on the treatment of non-print materials is abundant. Most of this literature underlines the importance of standardization and cooperation in all of data collection, format, and distribution. Both Great Britain and the United States have established major clearinghouses for reliable information about non-print educational resources.

Current computer technology enables networking by resource and information specialists. Networking implies a cooperation by people, groups, or sections in sharing effort and cost, while maintaining control over matters of individual concern. Networking is a compromise between the bureaucratic problems created by a central agency's attempting to perform all functions for all groups, and the expense of numerous organizations duplicating the same tasks on the same materials.

The establishment of an information-sharing network would be facilitated by the following steps:

1. Determine procedures and funding for the provision of some form of coordination of information dissemination activities regarding educational software.

2. Begin collecting standardized descriptions of educational software packages.

3. Decide on data elements or fields to be used in describing educational software.

4. Circulate suggested fields and rationales to computer-using educators for comments and possible revision.

5. Decide which materials are to be included in the software database.

6. Design an organizational scheme to collect descriptions of educational software.

7. Decide what products are to be generated by the database.

8. Select an appropriate cataloguing code.

9. Select an indexing method appropriate in both an on-line and manual search situation.

10. Select a delivery system which can:
    a. create a database of descriptions of educational software;
    b. provide cataloguing services;
    c. generate catalogue cards or COM;
    d. generate a quality print catalogue as a selection tool;
    e. provide on-line access to database records;
    f. provide expertise, experience, and guidance in database creation;
    g. accommodate PRECIS indexing, if required;
    h. accommodate additional files of information in an educational software database.

11. Analyze the cost, procedures, and implications of a delivery system using FORMAT, PRECIS, and UTLAS, by convening a meeting of the Steering Committee for this Stage 1 report, the coordinating agency, the users and holders of these three formats, users of MARC format, and the JEM research team.

12. Accommodate the use of both official languages in designing the information-sharing network.

RECOMMENDATIONS

The recommendations for a plan of action are based on two notions essential to the solution of the educational software information problem:

1. There should be a standard descriptive format which can be used to describe all educational software. This format should provide data relevant to the needs of all users--students, teachers, administrators, and resource personnel--and should conform to guidelines which anticipate or accommodate not only present, average examples but also future and exceptional examples.

   In a standard description, 26 fields of information should be used:

   Accession Number
   Package Title
   Series Title
   Edition
   ISPN
   Author
   Producer
   Distributor
   Copyright Date
   Restrictions
   Cost
   Computer Model
   Memory
   Operating System
   Language
   Storage Medium
   Peripherals
   Descriptors
   Classification
   Application
   Instructional Strategy
   Grade Level
   Special User
   Abstract
   Evaluation Stage
   Display Language

   The researchers also suggest that cataloguing methods should include both library and vendor catalogues, as a library tool and as a purchase tool respectively. The information provided by the library catalogue would help the user determine:
   - whether the collection contains a specific item;
   - which works by a particular author are in the collection;
   - which editions of a particular work are in the collection;
   - what materials a collection has on a specific subject.

   The researchers note problems school libraries currently have with the organization of non-print materials, such as:
   - lack of a link between the classification system and an accession number;
   - lack of full and comprehensive cataloguing cards;
   - lack of a comprehensive, multiple-type classification system; and
   - lack of consistent, uniform cataloguing codes.

   Vendor catalogues should contain information about products available for purchase, but their usefulness is impaired by:
   - insufficient information;
   - questionable value judgements inherent in the subjective nature of each;
   - inadequate indexing systems which require the reading of every description to determine appropriate material;
   - lack of standard formats between and within catalogues, making comparison extremely difficult; and
   - profusion of different catalogues.

   A catalogue of educational software should:
   - contain public domain and commercially-produced software;
   - provide thorough, standard descriptions;
   - indicate what educational software is currently available;
   - be updated yearly;

- provide suitable indexing by subject;
- provide easily-understood indexing;
- provide information appropriate to decision-making on suitability, i.e., specifications, cost, availability, topics;
- be able to be produced economically and efficiently.

In addition, the researchers describe suitable indexing methods which should be adopted in establishing a network: library indexing, print catalogue indexing, ERIC, and PRECIS.

Materials in libraries are most often indexed by title, author, and a subject heading. This method can create problems as a result of the growing number of subject headings for such a rapidly-growing area as educational software:
- subject terms become outdated because of new educational jargon;
- terms may be too specific or not specific enough;
- "see" and "see also" references need to be continually updated, also, because of the growth in vocabulary.

Print catalogue indexing may be inadequate because of a lack of cross-referenced or comprehensive subject headings and subject, grade level, and hardware specifications.

ERIC has created its own vocabulary of keywords and a thesaurus, which provides an alphabetic listing of all terms. The thesaurus compares old and new terms, and provides a rotated descriptor display. The one drawback to ERIC is that it is designed for machine access, whereas at this time, the print catalogue is the most accessible.

PRECIS (Preserved Content Indexing System) produces a printed index for manual retrieval and accommodates the potential for machine access. PRECIS is a machine-produced alphabetical indexing system, based on a natural-language-based syntax. PRECIS seems most appropriate for present needs of users of educational software in that it:
- caters to both manual and machine retrieval systems;
- can be used to reflect Canadian terminology;
- has been utilized in bilingual applications;
- has readily available software in a Canadian system (UTLAS);
- has proven useful in indexing non-print materials generally and educational software specifically.

2. The system should
   a. at all times preserve the quality of these descriptions by rigorous adherence to standards, while compromising to accommodate unique requirements; and
   b. take advantage of the cost and effort economies derived from a cooperative network.

The 12-point system outlined above would involve cooperative collection and organization of information, and would be under the direction of a coordinating agency with two responsibilities:

a. representation of all user needs, and
b. maintenance of the quality and integrity of the standard descriptions which will form the database.

It is more than likely that these responsibilities will run counter to one another from time-to-time. However, a coordinating agency which is intimately involved in the generation of descriptions and the various needs of all users is the best vehicle to resolve conflicts of interest.

The major advantages of a coordinated information sharing effort accrue during the gathering and organizing of the information. The information can be easily disseminated by individual provinces or regions once they have the original, standardized data. This individuality would allow network participants to distribute information in the form which best accommodates their own educational resource requirements.

Recommendation 1: That a coordinating agency be designated to complete the 12-point implementation plan outlined above, and described in the JEM Research report.

Recommendation 2: That a database of standardized educational software descriptions be established in order to provide a basis for:
a. a selection tool to aid educators in purchasing educational software; and
b. central cataloguing records.

Recommendation 3: That the 26 fields described on Page 4 of this report constitute the basis for a standardized description of educational software.

Recommendation 4: That all software materials described in the database should be:
a. educational in nature (relating to the fields of education, teaching, and schooling);
b. operationally ready;
c. free of non-Canadian material inappropriate for Canadian students;
d. available for distribution in Canada.

Recommendation 5: That software material be subjected to a four-stage evaluation:
a. minimum entrance criteria, as suggested in Recommendation 4;
b. cross-reference to evaluations published in the literature or available from evaluation organizations;
c. comprehensive evaluations by trained subject specialists using a standard evaluative instrument;
d. designation of provincial authorization or prescription.

Recommendation 6: That the database contain at least two separate files--a Descriptive File and an Evaluative File. Records for the Descriptive File should be given immediate priority.

Recommendation 7: That the cooperation of producers of commercial educational software be sought in collecting descriptions about their products.

Recommendation 8: That the cooperation of provincial organizations of computer-using educators or some other provincial or regional interest group be sought in the task of collecting descriptions of public domain software originating in their provinces.

Recommendation 9: That an Input Form and accompanying guide, based on the final list of agreed fields of an educational software description, be designed and distributed to the producers and provincial groups to ensure that all descriptions collected appear in a standard format.

Recommendation 10: That the coordinating agency be responsible for collection, completion, and initial processing of Input Forms, as well as encouraging ongoing submission of such forms.

Recommendation 11: That a print catalogue which educators can use as a selection tool, and cataloguing records which can be used by librarians to organize collected resources be developed with the utmost urgency.

Recommendation 12: That, with reference to the products in Recommendation 11, on-line cataloguing records and an on-line product catalogue be developed with all speed. They constitute lower priority in terms of immediate availability to educators, but equal priority in terms of development and delivery system consideration.

Recommendation 13: That the cataloguing rules for machine-readable data files be adopted.

Recommendation 14: That a keyword indexing method be utilized and that serious consideration be given to a PRECIS-type management system of the keywords or descriptors.

Recommendation 15: That detailed analysis be done to determine the cost, procedures, and implications of a delivery system which makes use of the combined resources of FORMAT (National Film Board), PRECIS (University of Toronto), and the cataloguing services of UTLAS.

Recommendation 16: That the language of each description reflect the display language of the educational software.

Limited copies of the full report are available from the Planning & Research Branch of Alberta Education, 9th Floor, Devonian Building, 11160 Jasper Avenue, Edmonton, Alberta, T5K 0L2 (Telephone 403/427-2991).

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